

WFPC2 Images of the Icy Galilean Satellites

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We have observed Europa, Ganymede and Callisto with the Wide Field Planetary Camera 2 (WFPC2) aboard the Hubble Space Telescope (HST). Images were obtained in six filters ranging from the ultraviolet to the near-infrared (effective wavelengths extend from $\lambda = 286$ nm to $\lambda = 954$ nm). The ultraviolet filters sample wavelengths not observable by either Voyager or Galileo imaging experiments. Observations made with the Planetary Camera have a scale of approximately 150 km per pixel. Leading and trailing hemispheres of each satellite were observed.

HST images are compared with Voyager image mosaics projected onto a sphere with Minnaert limb-darkening and convolution to the same resolution as the HST images. Nearly all observed albedo features correspond to features in Voyager images, with a few notable exceptions. Small differences (on the order of 10%) are likely due to errors in the photometric calibration of Voyager mosaics and/or errors in the assumed photometric function for particular regions. The greatest differences between Voyager and HST images occur on Ganymede where HST images show a higher than expected albedo at visible and near-infrared wavelengths over a region extending from about 45° S to the South pole at 275° W longitude. Europa at $\lambda=675$ and 954 nm (wavelengths not observed by Voyager) appears nearly featureless, in contrast to its appearance at shorter wavelengths. We compare spectrophotometry of these and other selected regions to search for evidence of compositional effects that may account for these observed differences.

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